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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/816,080	04/01/2004	Marek Matusz	TH-0996 (US)	8885
23632	7590	06/08/2010		
SHELL OIL COMPANY P O BOX 2463 HOUSTON, TX 772522463			EXAMINER COVINGTON, RAYMOND K	
			ART UNIT	PAPER NUMBER
			1625	
			MAIL DATE	DELIVERY MODE
			06/08/2010	PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

### Office Action Summary

**Application No.**

10/816,080

**Applicant(s)**

MATUSZ ET AL.

**Examiner**

Raymond Covington

**Art Unit**

1625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 30 April 2010.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/CD)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Lauritzen et al US 4808738 in view of Shell WO 95/17957, Evans et al US 5418202, and Lauritzen et al EP 00352850 in further view of Habenschuss et al CA 1286687, Carlson CA 488990 and Evans WO 01/96324.

Lauritzen et al US 4808738 discloses a catalyst for use in olefin epoxidation via olefin, oxygen and halide feed wherein Example 5-2 a silver containing catalyst having 0.5 mmole rhenium per kilogram catalyst. Said catalyst is described in the "Illustrative Embodiment 4" to utilize the support "carrier B", which according to Table 1 is an alpha alumina support having a B.E.T. surface area of 0.42 m<sup>2</sup>/g. By calculation, the distribution of rhenium is 0.0012 mmole/m<sup>2</sup>. It follows from the Table 5, that caesium and sulfur atoms are likewise present in the catalyst. "A promoting amount of rhenium and a promoting amount of a rhenium co-promoter selected from sulfur, molybdenum, tungsten, chromium and mixtures

thereof supported on a porous, refractory support" is also part of the catalyst (cf. column 2). Lauritzen et al US 4808738 further discloses in column 3, second paragraph, that silver and rhenium are deposited on a carrier. Lauritzen et al US 4808738 still further discloses (Table 2, claim 2) the use of the above catalyst in the preparation of ethylene oxide starting from a feed mixture comprising ethylene, oxygen, chlorohydrocarbon modifier. In column 20 it is said, that the temperature is increased during the reaction, and that "during the entire test run" the feed mixture consists of 4.4 to 5.6 ppmv vinyl chloride. Given the definition of "a relative quantity Q which is maintained constant" in the present description, all of the features of independent claim 1 are disclosed in Lauritzen et al US 4808738. It is also stressed that the present definition in the claim, that "the reaction temperature is increased to at least partly reduce the effect of loss of activity of the catalyst", is a functional definition, which does not appear to support the applicant's interpretation, that the disclosed temperature increase in the prior art would not be suitable to meet the said function, namely to reduce an effect of loss of activity of the catalyst. The reference differs in that the specific relative quantity Q been disclosed.

However, Shell WO 95/17957 discloses as "Illustrative Embodiment 3" a silver containing catalyst having 1.5 mmole rhenium per kilogram catalyst.

According to Table VI various alpha alumina supports have been employed. The upper limit of the BET surface area of "Alpha Alumina #1" is 1.4 m<sup>2</sup>/g. By calculation, the distribution of rhenium is 0.001 1 mmole/m<sup>2</sup>. As the surface area of #2 to #3 alpha alumina is even higher, a more loose distribution of rhenium compared to that of the above-mentioned example is present in these embodiments. Further ingredients of the catalyst are caesium and sulfur atoms. "Other promoters in promoting amounts may be optionally present such as rare earths, magnesium, rhenium co-promoters selected from chromium, molybdenum, tungsten and mixture thereof" (page 3). The examples of Shell WO 95/17957 further disclose the use of the catalyst for the epoxidation of ethylene. The feed comprises also oxygen, chloro hydrocarbon modifiers of 0.3 to 20 ppmv (see Table 1). The temperature is increased during the catalytic process (see page 27). In the light of the above discussed functional definition Shell WO 95/17957 is considered to disclose in combination all features of recited claims.

Evans et al US 5418202 also teach an analogous process involving the use of a silver catalyst in a olefin epoxidation via olefin, oxygen and halide feed reaction. While Evans et al US 5418202 does not teach the Q ratio per se, Evans et al US 5418202 does disclose sufficient data and process parameters to calculate Q. see, for example, column 18 lines 42-47.

Further the above would have been particularly obvious in further view of Lauritzen et al EP 00352850 which also teach an analogous process involving the use of a silver catalyst in a olefin epoxidation via olefin, oxygen and halide feed reaction the process is operated at a level maintaining the selectivity to olefin oxide by modifying the halide level in a manner which corresponds to the Q ratio recited in the claims. see, for example, page 2 lines 37-45 noting also the general process in lines 4-24.

In view of the above it would have been obvious to modify Lauritzen et al US 4808738 to obtain the process parameters recited as the results, the use of somewhat different but otherwise analogous starting materials in an otherwise known process would not have been unexpected and therefore obvious.

Regarding applicants' comments it is noted that while the references do not teach that there is a loss of catalyst activity and that the reaction temperature is raised to at least partly reduce the loss of activity. Applicants also argue 2) that the art teach teaches only increasing the amount of halohydrocarbon as opposed to maintaining the relative quantity of halohydrocarbon. Lastly applicants argue 3) that rhodium is not present in the prior art catalyst within the recited range.

As to 1) above, it is noted that it is well recognized that "reaction systems generally deactivate over time, i.e., the activity of the catalyst begins to decrease as

the process is carried out.” To overcome this it is known increase the temperature of the reaction at a rate to maintain a given activity. See Habenschuss et al CA 1286687 page 6 last paragraph and page 7 first paragraph. See also Carlson CA 488990 page 4 lines 18-24. To apply this well-known technique to an otherwise known process would have been obvious as the results would not have been unexpected.

As to 2) above, it is noted that halohydrocarbons, e.g., chlorohydrocarbon are well-known as moderators for catalysts used in olefin epoxidation processes corresponding to those recited in the claims. See, for example. Evans WO 01/96324 page 8 lines 11-21. It is also noted that Evans teaches continuously adjusting the chlorohydrocarbon during the reaction to maintain a certain activity level. The same is also taught by Carlson CA 488990. See page 4 lines 10-12.

As to 3) above rhodium corresponding to that recited in the claims was noted in the previous office action. Catalyst containing a rhodium component in the recited amounts with a support corresponding to the type recited in the claims would inherently have the claimed surface area ratio.

It would have been obvious to use somewhat different both otherwise analogous process parameters, such as temperature and halogen content relative to starting material, in an otherwise known olefin catalytic epoxidation process in

order to optimize an outcome known to be desired in the prior art, i.e. catalyst activity, reaction times, product output or purity.

No claim is allowed.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Covington whose telephone number is (571) 272-0681. The examiner can normally be reached on M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Janet Andres at telephone number (571) 272-0867.

The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/R. C./  
Examiner, Art Unit 1625

/Janet L. Andres/  
Supervisory Patent Examiner,  
Art Unit 1625



